BOURNEMOUTH NATURAL SCIENCE SOCIETY & MUSEUM

Share our love of science

Newsletter Early Summer 2021

Close up of Crab spider showing eyes and hairs (see article on p2)

In this Issue:

www.bnss.org.uk

Charity No. 1165951

BNSS News Update *The Trustees*

Dear Members, We hope many of you have been able to enjoy the recent improvement in the weather and 'engage with nature' again. Our Tuesday volunteers have been back at the BNSS since May 18th and have again been working on the collections and preparing for re-opening to the public hopefully in July although this will depend on Government legislation and guidance. Meanwhile, the trustees have initiated a number of investments in our facilities and infrastructure in line with the Society's long term objectives to preserve the collections for present and future Bournemouth generations. These have mostly been funded from Government grants, successfully applied for by the Trustees, and zero business (building) rating for the closure period. Building on the successful 'Zoom' meetings which have been organised since April 2020 by Mary Thornton and others, we want to continue to be able to broadcast our talks even when we return to physical meetings in the building. Therefore we have upgraded our audio-visual system to enable this as well as replacing our projector and speakers, to provide an improved experience for the 'in house' audience. We are grateful to Jo Crane for providing technical knowledge to guide us to an appropriate system which we are now testing for launching before the end of June. /cont. p2

We are still looking for a 'Membership Secretary' to ensure continued income from subscriptions.
If you have some time and can 'run a spreadsheet', please tell us.
When we re-open the museum to the public, we will need more stewards.
Would you like to be a steward, to welcome visitors and to help show them our exhibits?
Our new audio-visual system is installed and will be up and running before the end of the month.
Would you like to be part of a live audience when we can re-start 'in house' lectures?
If YES, email contact@bnss.org.uk, or leave a message on 01202 553525.

BNSS News Update - continued *The Trustees*

In other important investments, we have engaged a contractor to excavate at the front of the building (right) to cure damp issues, repair the lecture theatre roof and boundary fencing. We hope to make further improvements on the first floor and basement in line with recommendations of our last fire safety report.

A particular improvement, planned is to improve disabled access to the garden (see p12). Preparatory, tree work and clearance has been completed and contractors will hopefully start work on levelling the paving slabs to the side of the lecture theatre and re-instating the path between the gates soon.

Excavation in the car park, credit Bruce Longstaff

CRAB SPIDER *Misumena vatia* *Martin Western*

Crab spider blending extremely well into a white flower

Showing why it is called a crab spider

Crab spiders are the most common spiders. They are ambush predators and use camouflage to blend easily into the background. Changing colour to match their background (see above) can take up several days. The name comes from the similarity to real crabs (above right) with their long front legs and they can move sideways and backwards. They are up to 10mm in size and most often seen on white or yellow flowers and found virtually anywhere including the BNSS garden. I find them easy to study as they never move and are essentially daytime hunters. Their large front legs are used for grabbing their victims and the powerful venom kills even large insects and enables them to digest a victim. They have four pairs of eyes with excellent vision. They can give a nasty bite so handle with care. They show sexual dimorphism with the much smaller male liable to become a meal for the larger female (right) . My close-up of a female (page 1) reveals what look like hairs or spikes. I couldn't find any information about them; one possibility is they could be additional aids in controlling a victim. If anybody has information about these hairs please let me know.

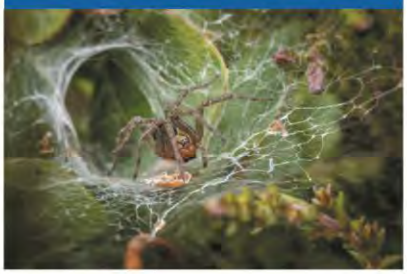
Shows male and female size disparity

Photographing Nature in your Backyard

With Covid-19 and traveling restriction, it's not a bad idea to stay local and photograph plants and wildlife from the comfort of your garden or your local forest. Here is a small selection of tips to help you with your photography.

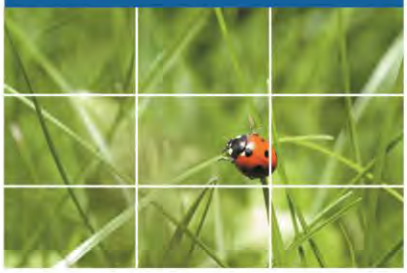
Bird feeders and water fountains are an excellent choice to attract wildlife. Place your camera somewhere where you can sit comfortably and away so birds don't see you. If you are using a mobile phone attach your phone to a stick near the bird feeder or water fountain and set a time-lapse and this will take a photo every few minutes. Be extra careful as birds can be very curious about your phone!

Your garden will offer a huge selection of subjects such as insects, spiders or plants but sometimes you will have to focus very close to your subject. If you are using a camera you will probably need an additional lens and if you are using your phone you could use a phone adaptor. When photographing insects try to focus on the eyes and with flowers focus on the stamens or the stigma.



Consider what time of the day you are taking your photos. Direct sunlight sometime creates hard shadows. Shoot early in the morning and just before sunset and check your photos to see if that is a look and feel you want for your photography. Each Season is beautiful, overcast days are also great as clouds diffuse light and you do not get hard shadows on your subjects.

The Rule of Thirds says that for a balanced composition you need to place the interesting point of your image in either the intersections or a whole line of a 3x3 grid. The relationship between negative space and your subject creates a natural focal point. See example below. It worth remembering that this rule can improve but also the rule can be broken!



Try different angles and distances. A low angle shot can make your subject appear huge. With a wide angle you can include the background. Experimentation is the key here. If you are getting confused try to keep some notes how you have placed your camera, the distance, it will be helpful when you need to revisit!

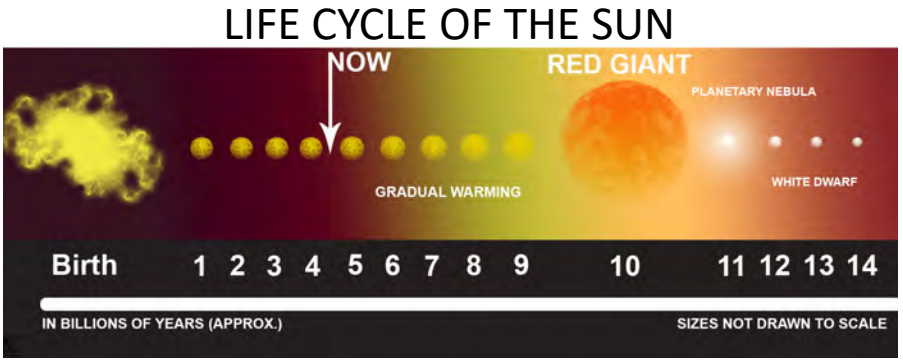
Remember to get the best photo you must take the photo in the first place! Do not overthink, take as many photos on a daily basis if you can. When your memory card is full, review them and put them aside. You will be able to decide which ones are the best when you have a large selection of images.

In addition search online for more tips about garden/outdoor photography, there is a lot of available advice from professional as well amateur photographers.

Eleni Dimitriou

Astronomy - The Sun's Life Story *James Fradgley*

The early days covered the formation of the Sun from a dust and gas cloud. It addressed the subjects of the Jeans criterion, rotation and magnetic fields, ionisation, and the T Tauri stage leading to protostars. This was followed by the Hayashi track, the Henyey stage: finally reaching nuclear fusion. For most of its life the Sun is burning hydrogen on the so-called "Main Sequence". After a definition of nuclear components, the processes involved were covered, including binding energy; the hydrogen to helium reactions PPI, PPII & PPIII and the CNO bi-cycle. As time progresses the Sun becomes slowly more luminous.



Stages of Sun's evolution from primitive solar nebula to white-dwarf. Wiki Commons

Eventually the Sun will become a Red Giant, burning hydrogen in a shell round the helium core. At this point there will be the first dredge-up, where material from the deeper regions reaches the surface through convection.

The helium in the core undergoes a helium flash as helium starts to burn to make carbon, followed by steady helium burning. Eventually this becomes helium shell burning. Thermal instabilities arise at this stage and the Sun puffs off much of its outer layers. Heavier elements can also be made at this point through the s-process. Finally, the Sun will become a White Dwarf. Some of the characteristics of these were described, including the radius-mass relationship. The Sun's will end up with about 55% of its present mass and will very slowly cool to become a Black Dwarf over billions of years.

Meteors *James Fradgley*

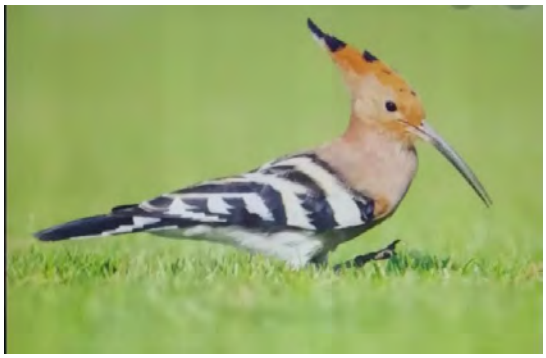
Steve Bosley, vice-chairman of the Hampshire Astronomy Group (HAG), first defined meteors, meteoroids etc, and looked at the IAU list of meteor showers, of which there are over 1,000. Approximately 50,000 tonnes of dust etc. falls onto the Earth each year, and there are about 10,000 meteorites greater than 100g, mostly falling into the sea. The BAA has an observation process and form for amateurs to use.

Perseid meteors light up the sky in August 2009 in this time-lapse image. NASA JPL

We then looked at all the equipment and procedures Steve uses for observation. He has 3 video cameras recording every night, triggered by movement. These can be triggered by aircraft, owls, gamma rays etc., as well as meteors. HAG has a complete meteor capture system, and it involves a lot of processing as some events are quite faint. To make it easier Steve has written software that captures 85% of the real event, but that still leaves 15% he doesn't want to miss. He has about 500,000 records over the last 5 years or so. There are many other similar observers in other places, and combining their data gives the object's trajectory and its orbit before reaching Earth. That also enables one to work out where an object may land if it's a meteorite. The meteorite found from the 28 February event was in exactly the centre of the estimated footprint. Looking at the spectrum of a meteor enables us to identify its constituents: they can be very variable.

Wild New Forest and "2020 in 2020" *Jill Abbot*

Last year the Wild New Forest team of **Russell Wynn** and **Marcus Ward** set out to identify and photograph 2,020 species from 1st January to 31st December. After five years as an organization, this was their first as a Community Interest Company. The challenge was undertaken alongside other research, monitoring and survey work being undertaken for Forestry England and other bodies. Russell's talk on 16th February, with a selection of 100 photographs, showed us how they got on.

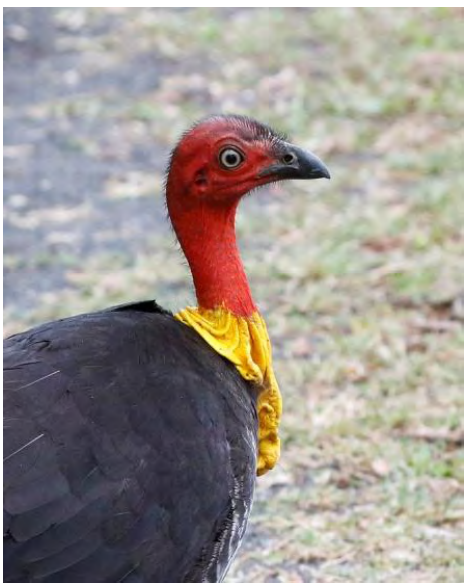


Credit: Russell Wynn & Marcus Ward

A weather graph reminded us of January storms, a mild spring, hot dry summer and variable autumn. The first lockdown saw Russell examining his own wildlife garden in forensic detail and pleased to find some uncommon invertebrates for the list. With grass verges remaining uncut, local walks were similarly productive, while evening walks and moth traps revealed a wealth of moths through April, including the mint-green Acleris literana, a specialist on oak trees. The changing season saw the wintering birds depart and the summer migrants arrive to look for suitable breeding sites. Others were just flying over on their way to their traditional locations but were captured on camera and sound. One special visitor was the hoopoe (above) seen in early July being mobbed by jackdaws. Later it was seen feeding alongside a song thrush and then being chased by a young peregrine, which it managed to evade. Mammals logged included all the Forest's species of deer, together with rodents, bats and mustelids including otter but not pine marten. Bat detectors and camera traps helped the search. Reptiles and amphibians added to the numbers. At the end of the year and with more movement restrictions it seemed touch and go whether the target would be met, but the close study of photos taken and further species identified showed it had been exceeded.

Cairns Country with a Camera *Jill Abbot*

Peter Allen's talks have previously taken us to a rainforest regeneration project in Brazil and on a hunt for a rare dragonfly in the USA. This February he took us to Cairns Country in tropical North Queensland - from the city of Cairns and its Centenary Lakes, south to the Atherton Tablelands, north to Daintree Rainforest and offshore to a Great Barrier Reef cay. The Daintree is a world heritage site with ancient lowland rainforest that dates back 135 million years. The unique continuity of its ecosystem makes it home to many endemic species, some no longer found anywhere else. It covers 1200 square kilometres and reaches down to the sea.



Brush Turkey, Credit Peter Allen

White-lipped tree frog, Australia, Credit JJ Harrison Creative Commons Attribution-Share.

Some stunning photos included the brush turkey (above), the Australian pelican, the olive backed sunbird, the white lipped frog (left), the blue tiger butterfly, the lotus lily and many more. The saltwater crocodiles were looked for on the Daintree River but proved elusive in the wild.

Marine Conservation

Mary Thornton

Dr Simon Cripps introduced us to the work of the Wildlife Conservation Society (WCS). This is an international NGO with HQ in the Bronx Zoo, New York. It was founded as a charity in 1895 and currently has billions of dollars in turnover funded by big business and philanthropic Americans. Their mission is to look after wildlife and wild places across 60 countries and the oceans. Science has been at the core of the Institution's mission. The science-based knowledge they collect and create is used by conservation practitioners to strengthen, practice, inform and reform conservation policy. They run four zoological parks across New York and a large aquarium hoping to inspire and educate people about the world around us.

Conserving and managing the vast wildlife aggregations, marine biodiversity, and fisheries that are sustained in coastal waters is a monumental task that few countries have the capacity to do on their own. WCS is responding by investing in ocean protection, sustainable fisheries, and marine species conservation across the waters of 23 countries and all five oceans where the need is greatest. They use their presence, pressure and scale to make a difference. Simon as Director of their Marine Programme is responsible for programmes that preserve habitat such as Coral Reefs, and flagship species such as the Whales, known as Ocean Giants: and Sharks and Rays. He recounted a nice story where recent developments highlighting whale song heard in the Hudson canyon has stimulated 'Pilotage Control Center' to require transiting ships to slow down their speed in order for whales to evade collision and damage. At last, a scenario where humans work round large mammals.

Across all Oceans there is a 50 Reefs Portfolio to Protect, Recover and Transform. The work is varied. In the Solomon Islands it was found the water was murky around the reefs inhibiting the coral from photosynthesising properly. Logging on the islands was allowing sediment to flow off the land into the water. This led to work on improving the watershed in order to protect the coral reefs.

Bleaching of corals is a well known and documented feature of warming waters. In the waters off the coast off Kenya and Tanzania, there are large underwater canyons - previously river courses when sea level was lower. In the colder water of these canyons, a researcher Tim McClanachan has found species of corals undamaged. Thus these areas acts as refugia for corals from the surrounding warming waters.

Clownfish amongst sea anemones, Credit WCS

Long term there is a target set by the COP on biodiversity to set aside 30% of the world's oceans as managed and 'no fishing' areas. WCS work with indigenous communities to support small scale fisheries in the teeth of pressure from industrial 'fish hoovering'.

Questions at the end of Simon's illuminating talk included querying how to stop the illegal turning off of the satellite tracking systems all ships and boats are required to use. At present, WCS are a conservation charity but they are working towards solutions which require international cooperation, needfully a long process requiring patience, new technology, negotiation and perseverance.

‘Snakes in the Heather’ *Mary Thornton*

Owain Masters, Education Officer for’ Snakes in the Heather’, gave a talk about this four-year project to conserve the UK’s rarest reptile, the smooth snake, and the internationally important heathland habitat on which it depends. The project also supports **Ben Limburn**, a long-time BNSS member, to oversee the survey side of the project. ‘Snakes in the Heather’ is hosted by Amphibian and Reptile Conservation (ARC), a charitable organisation that has its HQ locally in Boscombe.

ARC NGO has five overarching commitments - to manage nature reserves, to raise educational awareness, to conduct the monitoring and science of amphibians and reptiles, to influence policy and legislation and to provide guidance and advice. A fundamental difficulty is how to engage people to conserve these creatures that are not cuddly, sweet eyed and docile animals. They are seen as slimy or scaly, have slit eyes, forked tongues, are cold blooded, have sharp teeth, can be venomous and live below ground or slither across it in ‘sinister’ ways! However, amphibians and reptiles are extremely important to biodiversity. For example, reptiles are predators - by controlling populations of their prey items, such as rodents, they remove weaker animals from the food chain, keeping populations healthy and ecosystems in balance. Furthermore, as predators, snakes require large areas of habitat and conserving these areas for snakes supports entire natural systems. Much of the dry lowland heath in the south of England has been lost to development of housing and farmland over the past 30-50 years. Therefore, conserving our UK reptiles is as much about conserving their habitat. Now the Snakes in the Heather project, which grew out of a pilot project called the New Forest Smooth Snake Survey, and which was started by Ben and other members of staff within ARC, has created a partnership involving over 30 different agencies towards that end.

We are lucky to have all 6 species of native reptile in Dorset, adder, grass snake, smooth snake, common lizard, sand lizard and slowworm. The smooth snake and the sand lizard are the rarest; an important reason for developing a strategy for conservation of all heathland reptiles.

Credit: Ben Limburn

Smooth snakes are special: they have a cryptic nature, are non-venomous, a European protected species, a unique part of British heritage and a flagship species (indicator of ecological change). It is for all these reasons and more that ‘Snakes in the Heather’ was developed and funded.

One of the earliest parts of the project was designing ways to assist with recording information gathered during reptile surveys. The surveys themselves take place between spring and autumn and are of two kinds. Firstly, to conduct an emergence survey of numbers in 1 km grid squares in known or likely locations two or three times in early spring to create a hibernaculum database. Secondly, a refugia reptile survey which could mean observations of one to 2 ½ hours, six times a year, recording size, gender, condition of reptile together with environmental conditions and habitat type. Survey volunteers will be encouraged to use an app which has been developed for use on phones or tablets in the field and allows data sharing with other databases. ARC will use these results to continue to spread their message about the importance of reptiles and other nature on our doorstep, highlighting to the public and landowners why it is important to conserve dry heathland habitat. The project runs until 2023 and Owain and Ben are always happy to be approached should you want to be involved.

PETase *Grenham Ireland*

Plastics pervade our lives due to their range of use, low cost and durability but we have all become aware of the environmental problem we have been creating. Plastic bottle waste (below) now amounts to 600,000 tonnes per annum in the UK but the problem is global. Mary Thornton had invited **Rosie Graham** who told us about the background to the interesting work she was conducting as part of a £13.8 million initiative at Portsmouth University and perhaps a start of a solution to this problem. Polyethylene terephthalate (PET), the commonest constituent of bottles, is a polymer containing ester bonds synthesised from petroleum

Credit : dierk schaefer, via Wikimedia Commons https://www.flickr.com/photos/dierkschaefer/2629301274/

The crystalline form of PET was not thought to be biodegradable. However, research in Japan has identified a bacterium from rubbish dump sludge which uses this plastic as its sole carbon source by producing two enzymes. The first PETase starts breaking down the polymer and second related enzyme produces soluble products in this 2-step process. The Portsmouth group led by Prof. McGeehan have characterised the structure of this second enzyme and even produced a chimeric protein linking the enzymes and improving their performance. Rosie is involved in attempting to improve the efficiency of one of the enzymes by subtly changing the gene encoding it. This sort of approach could eventually lead to an industrial depolymerisation process and a circular plastic economy for such bottles rather than the linear one we currently use.

Coastal Management

Grenham Ireland

Alan Holiday gave us an interesting talk about changes to a small section of the coast east of Weymouth between Greenhill and Redcliffe Point which he has been documenting for some time. First he gave us an outline of the geology and then described the changes over time and the way the coastline has been managed or not managed depending on the perceived land value. This area consists of a layer of impervious clay overlain by harder but more porous rock such as limestone or sandstone.

Land slippage east of Swanage, Credit: Alan Holiday

Land slippage occurs (see above) when surface water softens the clay and the wave action of the sea undermines the cliff. In some places this has been allowed to continue whilst in others millions of pounds have been expended protecting the coast with gabions, groynes, sea walls, huge rocks or imported shingle banks. Of particular interest was the use in one case of the 'wrong sort of gravel' being taken from the 'Solent river area' near the Isle of Wight necessitating the eventual sieving of it to remove the 'fines' and allow it to become better at dissipating wave action like that which forms Chesil Bank.

Aotorea *Mary Thornton*

Credit: Paul van de Velde from Netherlands - Speed, CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=88259112

Mike Read is a good photographer who showed us excellent landscapes and close ups of a wide variety of New Zealand (NZ) birds. His walks through the podocarp forests showed us a primeval landscape of tree ferns. He recounted a trip he had made with the Travelling Naturalist. He was thrilled to make close contact with dolphins and albatrosses. However he reserved his admiration for the bar-tailed godwits that visit NZ but breed in Alaska. When they leave the northern autumn in Alaska, they would appear to fly non-stop to NZ in a flight lasting 5-8 days - a very long distance for such a small bird. He also was intrigued by the right hand curled bill of a Wrybill, the only bird species to have a one-way curled bill. This ingenious feature leads to all the birds walking the same way, clockwise, around stones to feel for food.

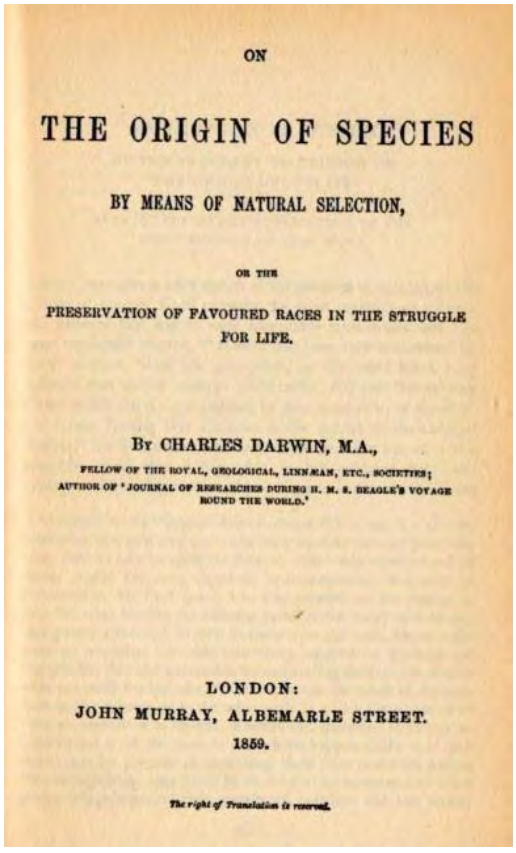
On the Origin of Species

James Fradgley

This "Zoom" talk explained **Darwin's book**. Few people have read the book, and the purpose of this talk was to go through the book and explain exactly what Darwin said. It was introduced by a short discussion about Darwin's background, some of the influences he absorbed, and the general zeitgeist he was in.

Then the book was covered, chapter by chapter. Inevitably this was a precis, or summary, of each chapter's contents. Darwin was ignorant of all the genetic processes with which we are familiar, and at that time the fossil record was very much less complete than it is today. He was therefore proposing a theory with far less background than we now have. However, the enormous amount of work he undertook, and the vast number of examples he quotes, were sufficient to be convincing.

After covering the book's contents, we then looked at how it was received, how it was misinterpreted, and how it became orthodox.



ON

THE ORIGIN OF SPECIES

BY MEANS OF NATURAL SELECTION,

OR THE

PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE.

By CHARLES DARWIN, M.A.,

FELLOW OF THE ROYAL, GEOLOGICAL, LINNÆAN, ETC., SOCIETIES;
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE ROUND THE WORLD.'

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1859.

A blueprint for the blue planet? *by James Dovey*

Book Review of "A Life on Our Planet" by Sir David Attenborough

Listen up! David Attenborough, our great communicator, has been at it again Ebury Press, RRP £20.00). It's a horror story set in the Garden of Eden …. the destruction of mankind & our planet. The final chapter, though, has yet to be written. The Introduction starts with the author's slow walk through the ruins of Pripyat (Chernobyl). It's an apt analogy at the heart of this work. We're living our lives in the shadow of a manmade, impending disaster. This dark presence runs the length of the book. The next section, the Witness Statement, takes us through very recent history, 1937-2020, from the Holocene into the Anthropocene. Here we see the world population has grown from 2.3 to 7.8 billion; atmospheric carbon has gone from 280 parts per million to 415 & the remaining wilderness has shrunk from 66 to 35%. All figures in this tour de force are precipitous. No figure, though, has more importance than the shrinking biodiversity – the planet's elixir. What Lies Ahead, without change, is then fleshed out. The nine boundaries, we dare not cross, are listed. Global warming is just one of the crises at work. As this next century races by the destruction of the environment crashes our biodiversity; the warming planet collapses the vast tundra; highly acidic oceans & exhausted soils see food production devastated. And on…… When the twenty second century arrives mass, enforced human migration will be upon us. In a methodical, yet subtle way, Attenborough reveals an apocalyptic future. The author then paints an alternative scenario…. A Vision for the Future. What do we need to do to regain a sustainable existence? The Vision has a comprehensive seven point plan. We all need to read it. The arguments appear sound and are known to work. A more equitable, Utopian world is revealed. The author then signs off. Our Greatest Opportunity awaits. He acknowledges our intelligence but says wisdom & the will to act is more important. I'll admit it - this book unsettled me. Redemption, though, is still possible. Do we have the Indomitable Will (MG) that's required? Well, Attenborough's now come up with a plan & it gets my vote.

Neither Animal or Vegetable! *by Grenham Ireland*

Book Review of "Entangled Life" by Merlin Sheldrake

Fungi are rather neglected so Sheldrake's book (Bodley Head, RRP £14.99) is very welcome. Whilst fungi, in the past, have often been lumped together with plants, he explains how at the molecular level they are more related to animals. However, instead of digesting things inside they secrete enzymes to breakdown plant and animal material externally and it is a good job they do. The book starts with a, perhaps overlong, description of a truffle hunt in Italy but, provided you can find your way out of the forest, there is a lot to discover in the subsequent chapters. We learn that the mushroom or toadstool is just the fruiting body producing spores and far more of the fungus can be found underground as a multicellular network of branching tubes, the mycelium, the growing tips of which can show complex behaviours. Later we learn how mycelia can form some of the world's largest living organisms as well as connecting to trees and forming what has been called the 'wood wide web'. Fungi can form intimate connections with plant roots called mycorrhizae which can provide nitrogen and phosphorus to the plant whilst the fungus receives carbon compounds. In fact it is now thought such interactions were important in allowing plants to colonise land 500 million years ago. Fungi also pair with algae to form lichens in a mutually beneficial or symbiotic relationship. The book also covers the use of fungi in the production of drugs such as penicillin as well as various psychedelic drugs, most now banned, which may be of use in treating mental illness. Not all fungi produce multicellular mycelia and single-celled yeasts which have had importance for humans for perhaps 9000 years in baking and fermentation are included. Perhaps the most startling section is the description of how certain ants can be controlled by a fungus growing inside their body which turns them into 'zombies' making them climb up high, clamp their jaw to a plant leaf and provide a means to disperse fungal spores from the fruiting body which grows out of the ant's head. Future uses of fungi are also covered including making new building materials and a potential role in breaking down plastics. Whilst the book is written as a popular science book, it is extremely well referenced allowing one to follow up any particular topic of interest.

Botany Section *Charlie Light*

As to be expected the Botany section's activities over the last year have been severely limited. Cataloguing of the Botany collection has been suspended and formal field meetings cancelled, however some informal Botany excursions have been possible between lock-downs.

The most significant part of the Botany collection is the herbarium- a collection of preserved plant specimens and associated data collected and donated to our society and is an important record of the wild plants that were growing roughly a hundred years ago in our area and elsewhere. The plants were carefully pressed and dried, and mounted on sheets of paper. The part of the herbarium that I have been working on was collected by BNSS member Mr C. B. Green who retired from London prior to the First World War and settled in Swanage.

In the process of photographing the specimens and recording the collection date, species and location data the historical context is apparent. Before WW1 paper for mounting was readily available and the paper quality is good.

Specimen of Early Purple Orchid collected by C.B. Green

As the war progressed, paper was diverted to the war effort and the resulting shortage is shown by the deteriorating quality used for mounting. By the autumn of 1917 old wrapping paper is all that was available! Sadly C. B. Green stopped collecting before final victory in the war and the return of good paper supplies.

Burnt Orchid, May 2020, Photos: Charlie Light

During our field meetings we continue to observe and record plants growing in our area but restrict ourselves to photographing them. We look forward to continuing with a full schedule of meetings in future.

Across, 1. Must, 3. Camelot, 8. Grecian, 9. Cedar, 10. Ootid, 11. Odontata, 13. Canadians, 17. Asexual, 19. Order, 20. Lucid, 22. Fanfoot, 23. Magnets, 24. User

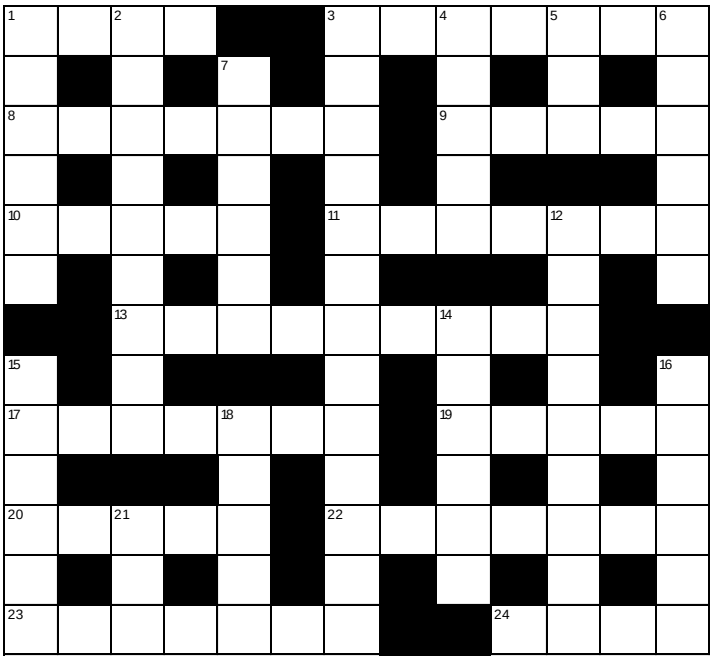
Down, 1. Maggot, 2. Spectacle, 3. CanfordCliffs, 4. Micro, 5. Lid, 6. Tornal, 7. Hidden, 12. Assiduous, 14. Acorns, 15. Pablum, 16.Crater, 18. Undue, 21. Cog

DON'T LOOK!

Solution for Crossword on p12

Special Feature - 'Simple' cryptic crossword

James Fradgley *(Solution – p11)*



Across:

1. Essential sexual frenzy (4)
3. Arthur often arrived here (7)
8. Old woman with confused frozen heart from SE Europe (7)
9. A tree that sounds like a planter (5)
10. Gosh! Note to daughter about raw egg (5)
11. O! No data to confuse an insect order (7)
13. Geese? (9)
17. Could be mitotic (7)
19. Demand a larger group than a family (5)
20. Clear dream explanation (5)
22. A moth with a cooler extremity (7)
23. I hear tycoons that are attractive (7)
24. Hesitant American employer (4)

Down:

1. Baby flier (6)
2. Impressive event to be seen with only one eye (9)
3. Able to cross steep things, might be local (7,6)
4. Moth or a millionth (5)
5. Cap top (3)
6. Edge of insect's wing, spoilt by others (6)
7. Concealed study concealed (6)
12. Idiot, one pair from America, and very careful (9)
14. Pannage (6)
15. Tasteless non-u food (6)
16. Hole to box the king (6)
18. Too much for a French expectation (5)
21. A minor player which turns (3)

Disabled Access *Jill Abbot*

Uneven paving in the passageway, Credit Bruce Longstaff

Feedback on the disabled access questions featured in the last newsletter is still welcome. A small number of members gave useful suggestions and shared their experiences at the Assembly too. Any access changes within the house are still awaiting consideration because of entry restrictions.

Plans for upgrading the side path beside the lecture hall to make it level are in hand. Wheelchair progress from the lecture hall and through the gate into the back garden, and around past the pond to the other gate will be improved. This work will also provide a safer and pleasanter way to access the garden for those who are less nimble.

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